

What is claimed is:

1. A method comprising:

providing trenches in a substrate to define a continuous, unbroken core in the substrate for an inductive component; and

5 providing a conductive material around the continuous, unbroken core to define a plurality of windings for the inductive component.

2. The method of claim 1 wherein the substrate comprises silicon.

10 3. The method of claim 2 wherein providing the trenches includes etching the substrate.

4. The method of claim 3 including etching the substrate to form trenches with slanted sidewalls.

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5. The method of claim 1 wherein the conductive material for the windings is provided along sidewalls of the trenches adjacent the core and along top and bottom surfaces of the core.

20 6. The method of claim 1 wherein providing trenches in the substrate includes forming through-holes through the substrate.

7. The method of claim 1 wherein providing trenches includes etching from opposite sides of the substrate.

8. An electronic microcircuit comprising:

5 a substrate including trenches that define a continuous, unbroken portion of the substrate to serve as a core of an inductive component; and
conductive material around the continuous, unbroken portion defining a plurality of windings for the inductive component.

10 9. The electronic microcircuit of claim 8 wherein the trenches extend through the substrate on either side of the core.

10. The electronic microcircuit of claim 8 wherein the substrate comprises silicon.

15 11. The electronic microcircuit of claim 8 including conductive pads on the substrate to provide electrical connection to the windings.

12. The electronic microcircuit of claim 8 wherein the trenches are located along sides of the portion serving as the core and are substantially parallel to one another, and
20 wherein the conductive material is provided along slanting sidewalls of the trenches and along top and bottom surfaces of the core.

13. The electronic microcircuit of claim 8 including hermetic feed-throughs extending from a trench on one side of the substrate to a trench on a second side of the substrate.

5 14. A method comprising:

forming a plurality of conductive lines each of which extends along a bottom surface of a trench in a substrate, along opposite sidewalls of the trench, and along an upper surface of the substrate on both sides of the trench; and

10 using a wire bonding technique to provide conductive interconnections among portions of the conductive lines to form a plurality of windings for an inductive component wherein the windings are composed of the conductive lines and the conductive interconnections.

15 15. The method of claim 14 wherein providing conductive interconnections includes, for pairs of adjacent conductive lines, coupling a wire bond from a portion of a first metal line to a portion of a second metal line, wherein the portion of the first metal line is located along the upper surface of the substrate at a first side of the trench and the portion of the second metal line is located along the upper surface of the substrate at a second, opposite side of the trench.

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16. The method of claim 15 including positioning a magnetic material in the trench as a core for the inductive component.

17. The method of claim 16 including tuning an inductance value of the inductive component by adjusting a position of the core.

18. The method of claim 17 including applying an electrical signal to adjust the
5 position of the core.

19. The method of claim 18 wherein tuning the inductance value includes passing through a range of continuous values.

10 20. The method of claim 17 wherein tuning the inductance value includes changing the inductance from a first value to a second value without passing through a range of continuous values between the first and second values.

21. An electronic microcircuit comprising:
15 a substrate;

a plurality of conductive lines each of which extends along a bottom surface of a trench in the substrate, along opposing sidewalls of the trench, and along an upper surface of the substrate at both sides of the trench; and

wire bonds interconnecting portions of the conductive lines to define a plurality of
20 windings for an inductive component wherein the windings are composed of the conductive lines and the wire bond interconnections.

22. The electronic microcircuit of claim 21 wherein each wire bond interconnects a portion of a first conductive line to a portion of a second conductive line, wherein the portion of the first conductive line is located along the upper surface of the substrate at a first side of the trench and the portion of the second conductive line is located along the upper surface of the substrate at a second, opposite side of the trench.

23. The electronic microcircuit of claim 22 including a magnetic material in the trench as a core for the inductive component.

24. The electronic microcircuit of claim 21 wherein an inductance value of the inductive component is tunable.

25. The electronic microcircuit of claim 21 wherein the inductive component is tunable over a continuous range of values.

26. The electronic microcircuit of claim 21 wherein the inductive component is tunable from a first value to a second value without passing through a range of continuous values between the first and second values.

27. A method comprising:
forming a plurality of conductive lines each of which extends along a bottom surface of a trench in a substrate, along opposite sidewalls of the trench, and along an upper surface of the substrate at both sides of the trench; and

positioning a cover over the substrate, wherein the cover includes conductive interconnections to interconnect the conductive lines to form a plurality of windings for an inductive component, wherein the windings are composed of the conductive lines and interconnections.

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28. The method of claim 27 wherein, when the cover is positioned over the substrate, each conductive interconnection interconnects a portion of a first conductive line to a portion of an adjacent second conductive line, wherein the portion of the first conductive line is located along the upper surface of the substrate at a first side of the trench and the portion of the second conductive line is located along the upper surface of the substrate at a second, opposite side of the trench.

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29. The method of claim 28 including positioning a magnetic material in the trench as a core for the inductive component.

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30. An electronic microcircuit comprising:

a substrate;

a plurality of conductive lines each of which extends along a bottom surface of a trench in the substrate, along opposing sidewalls of the trench, and along an upper surface

20 of the substrate at both sides of the trench; and

a cover over the substrate, wherein the cover includes conductive interconnections to interconnect the conductive lines to form a plurality of windings for an inductive

component, wherein the windings are composed of the conductive lines and interconnections.

31. The microcircuit of claim 23 wherein, when the cover is positioned over the substrate, each conductive interconnection interconnects a portion of a first conductive line to a portion of an adjacent second conductive line, wherein the portion of the first conductive line is located along the upper surface of the substrate at a first side of the trench and the portion of the second conductive line is located along the upper surface of the substrate at a second, opposite side of the trench.

32. The electronic microcircuit of claim 24 including a magnetic material in the trench as a core for the inductive component.